

Application No. 10/822,117
Response dated October 11, 2006
Reply to Office action of April 11, 2006

REMARKS / ARGUMENTS

Applicant thanks the Examiner for his time and courtesy extended during the telephone interview conducted on September 22, 2006. For the convenience of the Examiner and clarity of purpose, Applicant has reprinted the substance of the Office Action in *10-point bolded and italicized font*. Applicant's arguments immediately follow in regular font.

With respect to claim 1, Malchow teaches a system for mounting an engine comprising a first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis passing near the center of gravity of the engine and aligned other than orthogonally to the axis of the engine output shaft (figure 2, major principal axis passed through the center of gravity as shown in the figure and is not orthogonal to the output shaft 60), and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2).

The structure disclosed by *Malchow* is significantly different from the structure disclosed and claimed in the subject application. One of the most notable differences is that the claimed embodiments recite an engine mounting system whereby the pivotal axis of the engine passes near the center of gravity of the engine. As disclosed in the specification, configuring the engine mounting system in this manner allows for measurement of engine torque isolated from loads induced by installation misalignments, frame deflections, or acceleration-induced forces. Therefore, the subject invention allows for torque measurement in on-road driving applications, rather than in just controlled testing situations.

Malchow neither discloses nor teaches such an engine mounting system, and as will be explained below, in fact teaches away from such a system. While *Malchow* may disclose an engine mounting system in which the principal axis passes near the center of gravity of the engine, *Malchow* fails to disclose or teach anything regarding the location of the pivotal axis of the engine mounting system. This distinction is not mere semantics; the principal axis and the

Application No. 10/822,117
Response dated October 11, 2006
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pivotal axis are completely different things. The principal axis is an inherent property of a rigid body, closely related to the body's moment of inertia. Fundamental principles of dynamics teach that the principal axis passes through the center of gravity of the body. In this case, the principal axis of an engine will necessarily pass through the center of gravity of the engine.

In contrast, a pivotal axis is defined in the present Application as an axis about which the mass of the engine may rotate. In the disclosed embodiments, the pivotal axis is formed by the configurations of the bearings of the invention. Therefore, the location of a pivotal axis can vary depending on the configuration of the bearings, and does not necessarily have to pass through, or even near, the center of gravity of the engine. Each of independent claims 1, 9, 17, and 25 require that the pivotal axis must pass near the center of gravity of the engine, something that *Malchow* fails to teach or disclose. Indeed, *Malchow* never even mentions a pivotal axis.

The portion of *Malchow* that the Examiner has specifically cited as anticipating claim 1 (col. 2 lines 10-20 and figure 2) does not actually describe the invention of *Malchow*; instead, the cited passage is a description of U.S. Patent No. 2,953,336 (*Etchells*). *Etchells* taught an engine mounting system that used a pair of identical, elastomeric front engine mounts in a symmetrical configuration designed to minimize engine vibration. *Etchells* does not disclose or teach any way to measure engine torque. *Malchow* ignores *Etchells*' teachings about minimizing engine vibration in favor of using a rigid engine mount that can measure torque. Because *Malchow* teaches away from the *Etchells* system, it is apparent that *Malchow* is not an improvement of *Etchells*. The inventions of *Malchow* and *Etchells* have different purposes – *Malchow* to measure torque; *Etchells* to minimize vibration. Even though *Malchow* discusses *Etchells* in the passage cited by the Examiner, this passage does not reflect the teaching of *Malchow* and should not be used as a basis to reject the present invention.

Because *Malchow* does not disclose or teach an engine mounting system wherein the pivotal axis of the engine passes near the center of gravity of the engine, claim 1 is patentable there over. Claim 2 has not been amended in response to this rejection. Reconsideration and withdrawal of this rejection is respectfully requested.

Application No. 10/822,117
Response dated October 11, 2006
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With respect to claims 2, 10, 18 and 26 Malchow teaches said load sensing transducer measures rotational forces in only one direction (col. 1 lines 41-43, the force transducer measures compressive force not bending force in reaction to engine torque to provide a linear force characteristic of the engine and transmission).

For at least the reasons discussed above with respect to independent claim 1, 9, 17, and 25, Applicant contends that independent claims 2, 10, 18, and 26 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of these rejections is requested.

With respect to claims 3, 11, 19, and 27, Malchow teaches the first and second bearings are connectable to forward and rearward portions of the frame and engine and are in axial alignment to receive shaft portions on the pivotal axis at opposite ends of the engine (col. 2 lines 22-30, figure 2).

For at least the reasons discussed above with respect to independent claims 1, 9, 17 and 25, Applicant contends that dependent claims 3, 11, 19, and 27 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of these rejections is requested.

With respect to claims 4, 12, 20 and 28, Malchow teaches one of the bearings comprises bearing segments, each connectable to the engine and frame (col. 2 lines 48-53).

For at least the reasons discussed above with respect to independent claims 1, 9, 17 and 25, Applicant contends that dependent claims 4, 12, 20, and 28 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of this rejection is requested.

With respect to claims 5, 13, 21, and 29, Malchow teaches the bearing segments each having a first part glidably moveable with respect to a second part from a pivotal point on the pivotal axis (col. 2 lines 61-67, figure 6, pivot pin 36).

Application No. 10/822,117
Response dated October 11, 2006
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For at least the reasons discussed above with respect to independent claims 1, 9, 17 and 25, Applicant contends that dependent claims 5, 13, 21 and 29 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of this rejection is requested.

With respect to claims 6, 14, 22, and 30, Malchow teaches one of said parts contains a rolling element glidably moveable in a slot in the other part (col. 2 lines 61-67, figures 4 and 6).

For at least the reasons discussed above with respect to independent claims 1, 9, 17 and 25, Applicant contends that dependent claims 6, 14, 22 and 30 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of this rejection is requested.

With respect to claims 7, 15, 23, and 31, Malchow teaches wherein the other of said bearings comprises a compliant engine mount (col. 2 lines 10-13, rear mount 18).

For at least the reasons discussed above with respect to independent claims 1, 9, 17 and 25, Applicant contends that dependent claims 7, 15, 23 and 31 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of this rejection is requested.

With respect to claims 8, 16, 24, and 32 the reference teaches, the pivotal axis extends through the center of gravity (figure 2, major principal axis).

For at least the reasons discussed above with respect to independent claims 1, 9, 17 and 25, Applicant contends that dependent claims 8, 16, 24 and 32 are likewise patentable. Because Applicant has not traversed this rejection on the merits, Applicant does not accede to the accuracy of the Examiner's characterization of *Malchow* as applied to these claims. Reconsideration and withdrawal of this rejection is requested.

Application No. 10/822,117
Response dated October 11, 2006
Reply to Office action of April 11, 2006

With respect to claim 9, Malchow teaches a system for mounting an engine comprising a first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis aligned other than orthogonally to the axis of the engine output shaft, and so positioned that a conical volume formed by the center of one bearing and the circle defined by the surfaces of relative motion of the other bearing contains the center of gravity of the engine (figures 1 and 2) and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2).

As discussed above in connection with claim 1, Applicant contends that *Malchow* fails to disclose an engine mounting system in which the pivotal axis is positioned near the center of gravity of the engine. For at least the reasons discussed above, Applicant submits that claim 9 is patentable over *Malchow*. Reconsideration and withdrawal of this rejection is requested.

With respect to claim 17, Malchow teaches a system for mounting an engine comprising a "first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis aligned other than orthogonally to the axis of the engine output shaft (figure 1), and at least one of said bearings having rolling elements between the engine and frame (col. 2 lines 10-20 and lines 25-30, the engine mounts contain rolling elements that provide a roll rate), and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2).

As discussed above in connection with claim 1, Applicant contends that *Malchow* fails to disclose an engine mounting system in which the pivotal axis is positioned near the center of gravity of the engine. For at least the reasons discussed above, Applicant submits that claim 17 is patentable over *Malchow*. Reconsideration and withdrawal of this rejection is requested.

With respect to claim 25, the reference teaches a system for mounting an engine comprising a "first and second bearings (i.e. bushings) each connectable to the frame and the engine to form a pivotal axis about which

Application No. 10/822,117
Response dated October 11, 2006
Reply to Office action of April 11, 2006

said engine is free to rotate relative to said frame (col. 2 lines 10-20, figure 2), said pivotal axis aligned other than orthogonally to the axis of the engine output shaft (figure 1), and one of said bearings having a pivotal point outside the space between the surfaces of relative motion of said one bearing (col. 2 lines 61-67, figures 4-6), and a load sensing transducer including parts connectable to said frame and said engine for resisting and measuring rotational forces between said engine and said frame about said pivotal axis (col. 2 lines 39-43, one of the front engine mounts is replaced with a force transducer in order to measure torque acting on the engine), said load sensing transducer having an axis of sensitivity on a plane other than any plane which includes the pivotal axis (figures 1 and 2)."

As discussed above in connection with claim 1, Applicant contends that *Malchow* fails to disclose an engine mounting system in which the pivotal axis is positioned near the center of gravity of the engine. For at least the reasons discussed above, Applicant submits that claim 25 is patentable over *Malchow*. Reconsideration and withdrawal of this rejection is requested.

CLAIM AMENDMENTS

Applicant has amended claims 5, 6, 13, 14, 21, 22, 29, and 30 to correct a problem in the preamble. No substantive change is intended by these amendments, and these amendments were not made in response to patentability rejection.

CONCLUSION

Claims 1 – 32 are currently pending in this application, and all claims are under final rejection. Applicant presented the arguments detailed herein during the September 22, 2006 Examiner Interview and the Examiner indicated preliminary favorable consideration of the pending claims. Applicant thanks the Examiner for his consideration and effort on this matter and submits that this application is now in condition for allowance. Applicant respectfully requests that a timely Notice of Allowance be issued in this case. The undersigned is available to discuss by telephone this amendment or any other matter pertaining to this file

Application No. 10/822,117
Response dated October 11, 2006
Reply to Office action of April 11, 2006

Respectfully submitted,

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